

CLAIM AMENDMENTS

The claims have been amended as follows:

1. (Currently Amended) A radiation system comprising:

irradiation target positioning means for ~~placing~~ positioning
an object having an irradiation target to be subjected to
irradiation;

fixed, unmovable in a lateral direction, irradiation target
imaging means for non-invasively taking images of an irradiation
target region including the irradiation target;

irradiation means for administering radiation to the
irradiation target region according to prescribed irradiation
conditions;

position and direction measuring means for measuring positions
and directions of said irradiation target positioning means, said
irradiation target imaging means and said irradiation means, and
for computing relative positions and directions between them;

irradiation condition correcting means for obtaining position
and direction of the irradiation target region in the images using
computation results of said position and direction measuring means
and compared results obtained by comparing the irradiation target
regions in the images successively taken, including at least a
first image and a second image taken after said first image and
shortly before irradiation of the target, by said irradiation

target imaging means, and for correcting the irradiation conditions in which the obtained position and direction is reflected by modifying an irradiation plan initially generated from said first image;

control means for controlling the radiation to the irradiation target region in response to the irradiation conditions obtained as a result of the correction by said irradiation condition correcting means in accordance with the modified irradiation plan; and

wherein said position and direction measuring means measures positions and directions of said irradiation target positioning means, said irradiation target imaging means, and said irradiation means in a 3D coordinate system.

2. (Canceled)

3. (Original) The radiation system according to claim 1, wherein said irradiation target imaging means comprises a plurality of imaging devices of different modality, and wherein

said irradiation condition correcting means obtains the position and direction of the irradiation target region in the images using computation results obtained by said position and direction measuring means and compared results obtained by comparing the irradiation target region in the images taken by said imaging device of the same modality among the images successively

taken by said plurality of imaging devices of different modality.

4. (Original) The radiation system according to claim 1, wherein said irradiation target imaging means comprises: a high resolution imaging device for taking high resolution 3D images of the irradiation target region which are used for setting the irradiation condition; and a real-time imaging device for taking high resolution 3D images of the irradiation target region before and during irradiation, and wherein said irradiation condition correcting means obtains the positions and directions of the irradiation target regions in the images using the computation results obtained by said position and direction measuring means, compared results obtained by comparing the irradiation target regions in the images taken by said high resolution imaging device, and compared results obtained by comparing the irradiation target regions in the images taken by said real-time imaging device, and corrects the irradiation conditions using the images which are acquired by said high resolution imaging device and by said real-time imaging device, and in which the obtained positions and directions are reflected.

5. (Currently Amended) An irradiation target movement monitoring method of an irradiation system including irradiation target positioning means for ~~placing~~ positioning an object having

an irradiation target to be subjected to irradiation, fixed, unmovable in a lateral direction, irradiation target imaging means for taking images of an irradiation target region including the irradiation target, and irradiation means for administering radiation to the irradiation target region according to prescribed irradiation conditions in accordance with a modified irradiation plan, said irradiation target movement monitoring method comprising:

an image acquisition step of successively and non-invasively taking images of the irradiation target region by said fixed irradiation target imaging means;

a position and direction measuring step of measuring positions and directions of said irradiation target positioning means, said irradiation target imaging means, and said irradiation means in a 3D coordinate system, and of computing relative positions and directions between them; and

an irradiation target monitoring step of obtaining positions and directions of the irradiation target regions in the images using computation results obtained by said position and direction measuring means and compared results obtained by comparing the irradiation target regions in the images successively taken, including at least a first image and a second image taken after said first image and shortly before irradiation of the target, in the image acquisition step.

6. (Original) The irradiation target movement monitoring method of an irradiation system according to claim 5, wherein the irradiation target monitoring step obtains the positions and directions of the irradiation target regions in the images using computation results obtained in the position and direction measuring step and compared results obtained by comparing the irradiation target regions in the images successively taken by said irradiation target imaging means of the same modality.

7. (Currently Amended) A irradiation target position recognizing method of an irradiation system including irradiation target positioning means for ~~placing~~ positioning an object having an irradiation target to be subjected to irradiation, fixed, unmovable in a lateral direction, irradiation target imaging means for taking images of an irradiation target region including the irradiation target, and irradiation means for administering radiation to the irradiation target region according to prescribed irradiation conditions in accordance with a modified irradiation plan, said irradiation target movement monitoring method comprising:

an image acquisition step of successively and non-invasively taking images of the irradiation target region by said fixed irradiation target imaging means;

a position and direction measuring step of measuring positions

and directions of said irradiation target positioning means, said irradiation target imaging means, and said irradiation means in a 3D coordinate system, and of computing relative positions and directions between them; and

a target position recognizing step of obtaining positions and directions of the irradiation target regions in the images using computation results obtained by said position and direction measuring means and compared results obtained by comparing the irradiation target regions in the images successively taken, including at least a first image and a second image taken after said first image and shortly before irradiation of the target, in the image acquisition step, and of correcting the irradiation conditions by reflecting the positions and directions in the images by modifying an irradiation plan initially generated from said first image.

8. (Previously Amended) The irradiation target position recognizing method of an irradiation system according to claim 7, wherein the target position recognizing step obtains the positions and directions of the irradiation target regions in the images using computation results obtained in the position and direction measuring step and compared results obtained by comparing the irradiation target regions in the images successively taken by said irradiation target imaging means of same modality.

9. (Currently Amended) A radiation system, comprising:
- a positioning device for positioning an object including an irradiation target;
 - an irradiation device;
 - at least one fixed, unmovable in a lateral direction, imaging device for non-invasively generating images of an irradiation target region including said irradiation target;
 - a measuring device for measuring position and direction of said irradiation target based on said generated images using a three-dimensional coordinate system including coordinate positions of said positioning device, said irradiation device, and said at least one measuring device;
 - a processing device for determining a current position and direction of said irradiation target based on comparing successive generated images, including at least a first image and a second image taken after said first image and shortly before irradiation of the target, input from said measuring device using a predetermined algorithm; and
 - a controller for directing said irradiation device to irradiate said irradiation target based on said current position and direction of the irradiation target by modifying an irradiation plan initially generated from said first image.

10. (Previously Presented) The radiation system of claim 9,

wherein said at least one imaging device to generate said images in at least two different forms.

11. (Currently Amended) A method of radiating, comprising:
positioning an object including an irradiation target;
generating images non-invasively of an irradiation target region including said irradiation target using a fixed, unmovable in a lateral direction, imaging device;

measuring position and direction of said irradiation target based on said generated images using a three-dimensional coordinate system including coordinate positions of said positioning device, said irradiation device, and said at least one measuring device;
and

determining a current position and direction of said irradiation target based on comparing successive generated images, including at least a first image and a second image taken after said first image and shortly before irradiation of the target, input from said measuring device using a predetermined algorithm;
and

irradiating said irradiation target based on said current position and direction of the irradiation target by modifying an irradiation plan initially generated from said first image.

12. (Previously Presented) The method of claim 11, wherein

Application No. 09/964,481

said generating includes generating said images in at least two different forms.